

## Claims

What is claimed is:

- [c1] A network system providing integration, comprising:
  - a client computer;
  - a server;
  - a server-side cryptographic function providing cryptographic services located on the server;
  - a PKI-Bridge providing an interface between the server and the server-side cryptographic function;
  - a remote access switch providing an interface between the client computer and the server;
  - a client-side cryptographic function providing cryptographic services located on the client computer;
  - a dial-up client providing dialing services to access the remote access switch; and
  - a custom script dynamically linked library providing an interface between the dial-up client and the client-side cryptographic function.
- [c2] The network system of claim 1, further comprising:
  - a security device holding authentication information; and
  - a card reader attached to the client computer for reading the security device.
- [c3] The network system of claim 2, wherein a certificate is stored on the security device.
- [c4] The network system of claim 2, wherein the security device is a smart card.
- [c5] The network system of claim 1, further comprising:
  - a directory service accessed by the server-side cryptographic function.

- [c6] The network system of claim 5, wherein the directory service is lightweight directory access protocol compliant.
- [c7] The network system of claim 1, wherein the client-side cryptographic function and the server-side cryptographic function employ the same cryptographic scheme.
- [c8] The network system of claim 1, wherein the server-side cryptographic function uses a random number generator to generate a challenge string.
- [c9] The network system of claim 1, wherein a client-side cryptographic function uses a random number generator to generate a response string.
- [c10] The network system of claim 1, wherein the client-side cryptographic function generates a signed response string.
- [c11] The network system of claim 1, wherein the server-side cryptographic function generates a challenge string.
- [c12] The network system of claim 1, wherein the server-side cryptographic function verifies the signed response string.
- [c13] The network system of claim 1, wherein the dial-up client operates in terminal mode.
- [c14] A network system providing integration, comprising:
  - a client computer;
  - a server;
  - a server-side cryptographic function providing cryptographic services located on the server;
  - a PKI-Bridge providing an interface between the server and the server-side cryptographic function;

a remote access switch providing an interface between the client computer and the server;  
a client-side cryptographic function providing cryptographic services located on the client computer;  
a dial-up client providing dialing services to access the remote access switch;  
a custom script dynamically linked library providing an interface between the dial-up client and the client-side cryptographic function;  
a security device holding authentication information;  
a card reader attached to the client computer for reading the security device; and  
a directory service accessed by the server-side cryptographic function.

[c15] A client computer comprising:  
a dial-up client providing dialing services to the client computer;  
a client-side cryptographic function providing cryptographic services located on the client computer; and  
a custom script dynamically linked library providing an interface between the dial-up client and the client-side cryptographic function.

[c16] The client computer of claim 15, further comprising:  
a card reader attached to the client computer for reading a security device.

[c17] The client computer of claim 15, wherein a security device is a smart card.

[c18] The client computer of claim 15, wherein the dial-up client comprises a SDLogin component and a SDSetupDial component.

[c19] The client computer of claim 15, wherein the dial-up client automates the authentication process using a hidden terminal operating in terminal mode.